

US-Canada set ground rules for acid rain battle

Canada and the U.S. are preparing for a multi-million dollar attack on acid rain.

Both countries are prepared to commit money for acidic precipitation research, Canada's Environment Minister John Fraser and Administrator Douglas Costle from the U.S. Environmental Protection Agency told provincial environment ministers in an Ottawa meeting in January.

They met with Ontario Environment Minister Harry C. Parrott, Quebec Environment

Minister Marcel Leger and New Brunswick Environment Minister Eric Kipping.

The participants at the meeting agreed to begin collecting information on both sides of the border to lay the ground for the formulation of an international agreement.

This groundwork is scheduled for completion in mid-March, Dr. Parrott reported.

Some of the questions that must be answered by the Canada-U.S. research programs are:

- the reduction of emissions needed to reduce the acidity of precipitation;
 - the areas where acidity is sufficient to cause acidic precipitation;
 - how these emissions move through the atmosphere;
 - the social effect abatement measures may have and the uses for sulphur once it is removed.
- Ontario has committed close to \$5 million for research on acidic precipitation. \$3.7 million of this amount is being spent by

Environment Ontario for a variety of research projects related to the phenomenon, \$1 million by the Ontario Ministry of Natural Resources within its Strategic Plan for Ontario Fisheries program.

Some of the province's primary research objectives are:

- to prepare a state-of-the-art report on the acidic deposition phenomena with emphasis on cataloging the experience gained in similar programs in Europe and North America;
- to determine the atmospheric

transport and deposition of acids and acid-forming materials, metals and other relevant constituents;

- to determine the effects of atmospheric deposition on aquatic ecosystems;
- to determine the effects of atmospheric deposition on terrestrial ecosystems;
- to develop effective air pollution abatement alternatives;
- to implement efficient interim programs which will preserve and rehabilitate affected land and water areas.

1980 sport fish guides available April 23, 1980

Environment Ontario's unique sport fish guides, published annually since 1977, will be off the press and available free of charge April 23 — just in time for the opening of spring trout season on April 26.

Listing over 850 popular Ontario angling waters from which fish have been tested for contaminants, the publications "Guide to Eating Ontario Sport Fish," are available in three editions — Southern Ontario, Great Lakes and Northern Ontario from any office of the Ministries of Environment, Natural Resources, or Northern Affairs.

The new editions contain additional data on over 250 waterbodies from which fish were collected and tested during the past year. Environment Ontario's laboratories have tested over 58,000 fish for a variety of contaminants — mercury, PCBs, mirex and pesticides — since the start of the program.

Charts indicate the safe consumption levels by species and length for both short and long term vacations.

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Mike Caranci, industrial abatement officer from Environment Ontario's Cambridge office, points out details on the proposed interim PCB storage facility at Middleport to some of the 300 interested

citizens who attended the open house in Onondaga Township Hall. Middleport lies about 10 miles east of Brantford.

New guidelines control use of sludge on fields

Manure has been used as fertilizer since the dawn of agriculture, but the "concentrated" manure produced as sludge in sewage treatment plants often contains excessive levels of metals, nutrients and potentially noxious substances.

These undesirable ingredients may be detrimental to food-producing land, watercourses

and the health of humans and animals.

To prevent damage, the quality of sewage sludge to be used as fertilizer and its application to farmland is now controlled by comprehensive guidelines developed by Environment Ontario and the Ministry of Agriculture and Food.

"The guidelines will allow Ontario farmers to maximize the use of this valuable fertilizer and soil conditioner," Environment Minister Harry C. Parrott said in announcing the guidelines in the Ontario Legislature.

The new guidelines result from intensive research conducted since 1971 by agricultural and environmental scientists and concern both Ontario municipalities as sludge producers and Ontario farmers as sludge users.

About 34% of the sludge now produced in Ontario's sewage treatment plants is used on agricultural land. Forty per cent is incinerated and 26% is disposed in land-fill or composted.

The administration of the new guidelines will rest jointly with Environment Ontario and Agriculture and Food. Both ministries will inform farmers about sludge use and encourage them to use it on their fields.

Replacing 1973 interim recommendations, the new guidelines will:

Middleport storage plan under public scrutiny

Nearly 300 citizens from the Onondaga-Middleport area turned out for a Ministry of the Environment "Open House" on February 8 to acquaint themselves with the facts regarding Environment Ontario's proposal to establish an interim PCB storage site at the Middleport Hydro transformer station.

To most of them, the general consensus was that the proposal was "Not Welcome".

One of the major concerns facing Ministry and technical staff was to explain that the proposal was not a final decision, but the beginning of a deliberate process of study, assessment and public consultation.

The decision to proceed with assessment of the Middleport site was made following a report by M.M. Dillon Ltd., consulting engineers, which evaluated PCB handling systems and 53 potential

interim storage locations.

The Dillon report recommends separate bulk tank and warehouse storage facilities covering four acres on a minimum site size of 40 acres. The proposal is that Ontario construct one facility to serve the entire province until plans can be completed for permanent PCB destruction. The proposed storage facility will be expected to handle an estimated total of 5,000 tons of

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It's all one world...



(photo: Tessa Buchan)

Tombstones talk about acid rain

Tombstones are used by U.S. scientists to investigate the development of acid rain in North America, reports the laboratory services branch of Environment Ontario in its newsletter "Analysis".

About 2.5 million marble tombstones have been placed by the U.S. Veterans Administration since 1875 in various parts of the U.S. They are made from a relatively uniform material taken from

only three quarries and have been subject for a known time span to the influence of the atmosphere in a wide variety of climates and environments.

The investigation of the erosion of their surface and edges combined with air pollution and meteorological data may allow researchers to come to conclusions about long-term effects and about the history of acid rain on this continent.

EPA sues Hooker

Hooker Chemical Corporation and Olin Corporation are being sued by the U.S. Environmental Protection Agency for a total of \$125 million for the cleanup of four industrial waste sites in Niagara Falls, N.Y. This amount includes \$7 million of U.S. funds already spent to clean up the Love Canal area.

This action is just the starting shot in an all-out industrial waste war. The EPA has also announced that it has formed together with the U.S. Justice Department a "strike

force against hazardous waste pollution" and that it expects to file 50 similar suits against industrial waste polluters in 1980.

Sanitation for all

The World Bank will refuse sanitation system financing for Third World countries if the projects serve only a selected part instead of the whole community, was announced at a conference on the prevention of water-related diseases held in London.

The World Bank's decision is especially significant in view of the World Water Decade 1980-1990.

Science's tasks for the '80's

The basic processes that influence the quality of our environment are well understood by science, writes Environment and Technology magazine. But many answers to questions concerning large-scale exchange and flows of air and water that may be beneficial or injurious to the environment must still be sought. Some of the major subjects of scientific research in the coming decade are the following:

- The cleansing of the atmosphere by forests and other vegetation.
- Impoverishment of soils caused by acidic precipitation.

- Influence of acidic precipitation on the quality of lakes and streams and their flora and fauna.
- Increases in heavy metals levels in food crops and natural food chains as a result of direct deposition from the atmosphere.

- Fate of volatile pesticides and chemicals used in agriculture and forestry.

- Substances and processes involved in atmosphere-biosphere exchange.

The effort to establish acceptable standards and control technologies and to understand the nature and magnitude of threats from man-made pollutants will continue.

The effects of small quantities of food additives must also be realistically established.

A sound plan for the long-term management of radioactive wastes and dangerous chemical wastes must be developed.

Another critical area is water management. Extreme changes in weather patterns are not yet understood enough to allow the prediction of droughts and floods with any reliability and to permit the development of technological responses to such events. Factors affecting ground water also deserve much study.

The effect of non-point sources of pollution on water quality in streams and lakes deserves much further attention and technologies for water recycling and reuse as well as for the reduction of water consumption must be further developed.

Chemists live longer

A Royal Institute of Chemistry study of the mortality of chemists in Britain brought a surprising result: Chemists live longer than other professionals, despite their exposure to potentially dangerous chemicals. The proportion of death by cancer for British chemists is not only lower than among the general population, but also lower than among Swedish and U.S. scientists. The institute plans further

studies that would match the mortality of chemists to particular exposures, to work in particular industries and to drinking and smoking habits. Such data could provide an early warning system for the public.

The results of the survey do not show dangerous chemicals to be necessarily less destructive. They may rather indicate that chemists know how to handle them safely.

Plants create smog

Data collected during the past two winters by the Bay Area Air Pollution Control District in San Francisco suggest that in many suburban and rural areas hydrocarbons emitted by plants contribute more to smog than human activities.

At two suburban monitoring stations, plants accounted—for three-quarters of smog creating hydrocarbons. At a station downwind from Oakland and San Francisco they accounted for two-thirds of hydrocarbons.

The study also found that plants release more hydrocarbon on hot days than on cool ones, which explains why smog attacks mostly occur on very hot days.

NTA no threat

"NTA does not constitute an obvious environmental threat", concluded a special task force of the International Joint Commission after a thorough investigation of the potential ecological effect of the chemical used to replace phosphates in detergents.

Although the investigation left the question of anaerobic degradation unanswered, the task force suggested that "NTA should not be prohibited from use as a detergent builder."

"Sparky" reveals dirty water

The 20 cm Nile pike that emits electric sparks according to its health may be used by the sanitation

department of the West German city of Goepingen to monitor the quality of the water supply. Up to now the city used trout and goldfish as indicators of water quality, but the Nile pike is more accurate.

Its 0.08 volt pulses are monitored by electrodes fitted to the fish-tank. If the pulse rate of 400 to 800 for a healthy fish drops below a critical point, the flow of water to the city system can be automatically stopped until the situation is corrected.

"Footprints" measure runoff

"Footprints", images produced by light wave measurements taken by space satellites, are used by Environment Saskatchewan for hydrological surveys. The department's scientists believe the new system will provide a much more accurate estimate of the snow that will melt within a river basin than the old method of taking samples at designated points.

Quebec Environment Ministry formed

Quebec's Environmental Protection Service, formed in 1972, has been reorganized to become the province's Environmental Ministry. Its minister is Marcel Leger, formerly head of the Environmental Protection Service.

The ministry will be responsible for all industrial, municipal and agricultural activities that affect the environment, for the administration of pollution control schemes, and for the management of the public water supply and of ecological reserves.

Israel has cheap chickenfeed

Human waste, treated in a high-rate oxidation pond in Israel, has been fed with excellent results to chicken and fish, reports the Israel Institute for Technology. Treatment of the waste in the ponds costs about one fifth of the cost of treatment in activated sludge systems.

The ponds are less than half a metre deep. Partitions running to and fro along their length create a meandering path for the sewage that is agitated and driven round by a slowly revolving paddle wheel.

This treatment promotes the growth of a dense mat of protein-rich algae, which are skimmed off, dried and eventually used as feed.



Ontario

Ministry
of the
Environment

Hon. Harry C. Parrott, D.D.S., Minister

Graham W.S. Scott, Q.C. Deputy Minister

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Stormwater study promises more fun on the Rideau

A significant improvement of the quality of the water in the Rideau River in the Ottawa-Carleton area is the aim of a \$1.4 million stormwater management study announced by Environment Minister Harry C. Parrott.

The three-year study involves the co-operation of Environment Ontario, Environment Canada, the Regional Municipality of Ottawa-Carleton, the City of Ottawa, the City of Nepean and the Township of Gloucester. Half of the funds required will be supplied by the Ontario Provincial Lottery Trust Fund, the other half by the sponsoring agencies through the provision of money, manpower and laboratory facilities.

"Our prime objective is to develop a stormwater management strategy that will enhance recreational use of the Rideau River — swimming, boating and fishing — while protecting public health and accommodate orderly urban development", said Dr. Parrott.

The study's thrust will be aimed at a comprehensive evaluation of stormwater runoff from urban, developing and agricultural areas; the associated pollutant loadings; the effect of the pollutants on the receiving water; and the cost and effectiveness of techniques to control pollution from urban runoff.

The study is directed by a steering committee which directs the study including representatives of the National Capital Commission, the Ottawa-Carleton Health Unit, the Rideau Valley Conservation Authority and the Ministry of Natural Resources. The chairman of the committee is Ralph E. Moore, Regional Director, Southeastern Region of the Ministry of the Environment, Kingston.

Harry S. Loijens has been appointed co-ordinator of the study and administrative support is being provided by the Works Department of the Regional Municipality of Ottawa-Carleton. Water quality analyses are being provided by the Ottawa laboratories of the federal Environmental Protection Service.



Along the Rideau River lies one of Ontario's prime recreational areas.

(photo: MIT)

Storage under public scrutiny

(continued from pg. 1)

contaminated solids and fluids containing — various dilute concentrations of PCBs.

As part of the process preceding the eventual submission of the proposal to the Environmental Assessment Board, the ministry held a public information "Open House" in Onondaga Township Hall for citizens of the township and surrounding area.

The purpose of the public drop-in centre was to table as much information as possible for the citizens so they could become fully acquainted with the proposal.

In addition to ministry technical staff, representatives from the consulting engineer and environmental specialists were on hand to answer questions. The citizens were also given the opportunity to record their comments on the project.

Material available for the information of citizens during the "Open House" included fact sheets on PCBs, environmental assessment, the Middleport proposal, Ontario's waste disposal policy and illustrated display panels covering pertinent points in

the Dillon report.

A narrated slide show highlighted the story of PCBs, the ultimate method of destruction and the interim storage plan.

A citizens information committee has been established at the suggestion of the ministry. Its purpose is to provide residents in the area with data on the nature of the proposal and through progressive meetings to keep them acquainted with developments, reports, assessment findings and any other information that will assist in the understanding of the project.

The first meeting of the committee was held in Onondaga Township Hall on January 29. The chairman was Grant Mills, the ministry's West Central regional director from Stony Creek.

Nearly 30 people attended the meeting with the following groups being represented: the Township of Onondaga Municipal Council; the Town of Haldimand; the Six Nations Indian Reserve; the New Credit Indian Reserve; CAMSOP, a local citizens group objecting to

the installation of the facility; the Grand River Conservation Authority; the Brant County Health Unit; the Ontario Federation of Anglers and Hunters; the Ontario Federation of Agriculture; the Brant County Federation of Agriculture; the Hamilton Hunt Club; the Department of Indian and Northern Affairs, Ontario Region; Ontario Hydro, and M.M. Dillon Ltd.

Although this first meeting was

primarily organizational, some aspects of the proposed interim site were reviewed. At a future meeting of the committee, citizen members have asked that discussions cover: PCBs and the environment, what they are and how they affect us, the transportation of PCBs, and contingency planning and spill control. Specialists in each of these areas are expected to attend the meeting and explain and answer questions.

Special education workshop in May

Environment Ontario's special workshop designed to provide teachers with new ideas for introducing handicapped students to the environment will be held for the third time in Bolton, at the Outdoor Education Centre, May 9 to 11.

For more information contact the educational resources co-ordinator, Information Services Branch, Environment Ontario, 135 St. Clair Ave. W., Toronto, M4V 1P5.

Middleport study — what next?

The Middleport proposal open house in Onondaga was just a starting point, said L.F. Pitura, director of the Ministry's waste management branch.

His branch will continue studies and assessment, incorporating information and concerns identified by local residents, to complete a comprehensive environmental impact assessment document within the next three to six months.

This document will be filed with Ministry environmental assessment officials who will co-ordinate a thorough review by other government agencies involved. The assessment and review, when complete, will be made available for public scrutiny for at least 30 days to permit comment.

All of this information is then passed by the Environment Minister to the Environmental Assess-

ment Board which calls for further public scrutiny and comment, and sets a public hearing date. This permits adequate time for concerned citizens to prepare submissions or presentations.

The board makes a final decision after the hearing.

The Ontario cabinet has a 28-day period, if they so wish, to decide on any alterations to this decision.

Environmental education



(photo: Tessa Buchan)

Noise can kill...

Sounds can be pleasant, soothing — or disturbing, noxious and even dangerous. The lonesome wail of a loon on a camping trip may evoke nostalgic memories — or fill a person with fear. The baying of dogs on a hunt may excite their master or infuriate a person trying to sleep.

Unwanted sounds become noise. Noise is a pollutant and like all pollutants it can be harmful.

Both sound and noise are measured in decibels on a scale which corresponds closely to the ability of the human ear to hear.

Continuous high-level noise over a long period of time may cause hearing damage. Temporary hearing loss may be caused by even brief exposure to levels of 100 to 105 decibels.

There are case histories of hearing impairment caused by loud rock music.

Noise may increase body tension, affect blood pressure and the functions of the heart and the nervous system. It may also cause the skin to turn pale, muscles to tense, blood vessels to constrict and is believed to trigger such ailments as allergies and stomach ulcers.

Noise would not normally unbalance a well-adjusted person. Combined with other stress factors — domestic problems, illness or fatigue — it has been known to evoke strong emotional responses.

Comparing mortality rates in two similar Los Angeles neighborhoods, researchers found that the neighborhood closer to a noisy airport had a 19 per cent higher mortality rate than its much quieter counterpart. The people living close to the airport also suffered from a greater incidence of nervous breakdowns and birth defects.

it's up to society

Conceptual Theme: Pollution is a social problem and society is charged with the responsibility of controlling it.

Grade Level: Intermediate.

Concepts:

1. Sound is judged on loudness and pitch.
2. Noise involves irregular and intermittent sounds, localization, unnecessary sound, reverberation, unexpected sound, background noise and time of day.
3. Noise affects our everyday life.
4. There are ways to reduce noise pollution.

Questions: What is sound? What is noise? How do you tell sound from noise? Did you consider the receivers (the people who hear and complain about sound)? What is loudness? Will any sound become noise if it gets loud enough? How do we measure loudness? (Decibels — one decibel is the smallest change in loudness that the average human ear can detect.) How loud is normal talk?

At what level does noise become painful? What is pitch? Are high or low-pitched sounds more annoying? Do intensity (loudness) and pitch interact to determine sound or noise? What characteristics affect sounds? Irregular and intermittent sounds are usually considered noisy more often than steady sounds. Can you think of any sounds like this? How do you feel if you don't know where a sound is coming from? Do sounds that you feel are unnecessary bother you more than sounds that are necessary? What are some examples of this?

What is a reverberation (echo)? Can you hear them in any room? What is different about rooms that have echoes and those that don't? What do you do when you hear a sudden noise? Would you react the same way if you knew the noise was going to happen?

Can the area in which a sound is heard determine if it is noise or

not? What about a motorcycle in a residential area? In a city? In the country? Find out how much sound different kinds of machinery make. Is it noise when your mother runs the vacuum cleaner? What if you are trying to watch television in the same room? Are sounds 'noisier' at different times of day? What are some of the sources of noise (population explosion urbanization, automobiles, trucks, buses, motorcycles, airplanes and airports, industry)?

Field experiments

Field Activity: Visit various areas in the community that have different sound levels. Take a tape recorder if available. Fix the volume dial so it is always at the same level. Record for approximately five minutes and make a list of the sounds you hear during that time. Compare different areas. Compare the same area at different times of day. Where are the sounds coming from? What is making them? Do you classify them as noise? How

could some of the sounds be reduced? Eliminated? Can you think of an experiment to test your ideas?

physical effects

Follow-up: What are some of the physical effects of noise (hearing loss)? Emotional effects? Financial effects? Discuss ways that noise can be reduced in various areas. Study ways to find out how sound travels. What happens when sound waves enter the ear?

To find out what the Ontario Ministry of the Environment is doing about noise pollution, write for our brochure entitled, "Who Cares About Noise Pollution?"

The address is:

Education Information Services Branch, Ministry of the Environment, 135 St. Clair Ave. West, Toronto, Ont. M4V 1P5

New use proposed for Ajax sewage plant

Environmental hearings are under way in Durham Region on a proposal to convert the obsolete Ajax sewage treatment plant into a facility to treat liquid industrial wastes.

The proposal, by the Region of Durham, is to modify the treatment plant, which goes out of service this year with the opening of the new Duffin Creek plant, into an industrial waste facility with a capacity to treat 8.8 million gallons per year. The waste would consist of oils, solvents, salt, alkali and acid solutions, food wastes and similar industrial liquids from local and Metropolitan Toronto industry.

According to the region's

consultants on the project, Simcoe Engineering Limited, the plant would be capable of serving the automotive, metal finishing, electroplating, food and similar industries. It would not accept more toxic materials such as radioactive wastes, pesticides and PCBs.

Environment Ontario has provided \$170,000 in incentive funds to the region to cover the cost of engineering.

When the Environmental Assessment Board hearing chaired by Keith Laver completes sessions on the region's application, its recommendations will go to Dennis Caplice, director of environment approvals for Environment Ontario, for a decision on the proposal.



Mechanical spreading of manure is widely used on Ontario farms.

(photo: OMAF)

Ozone may damage crops

Ozone is generally blamed for interfering with ultraviolet radiation in the upper atmosphere, but a study conducted at Environment Ontario's laboratory shows that it can also have a serious impact on agricultural plants.

Aston Hinds, of the laboratory services branch, writes in the recent issue of the laboratory's newsletter, "Analysis", that ozone levels over 0.08 parts per million, if sustained for several hours, are toxic particularly to tobacco and white beans. Such concentrations can be observed in the

summer months and are due mainly to increased automobile traffic.

Financial losses to southern Ontario farmers due to ozone damage exceed at times several million dollars yearly.

Studies to determine ozone-caused changes in crop vegetation are continuing at the ministry's laboratory where plants are grown in a carefully controlled environment and symptoms of ozone damage are recorded by electron microscope.

Experts learn from Mississauga

To improve planning to handle emergencies of the type recently experienced in Mississauga, Environment Ontario organized in co-operation with the Hamilton Fire Department a four-day BLEVE — boiling liquid expanding vapour explosion — workshop in Toronto.

The workshop was attended by 97 experts from Environment Ontario and Environment Canada, the Ontario Ministries of Labour and Solicitor General, the RCMP, provincial, regional and municipal police forces, regional and municipal

fire departments, and regional public works departments.

Participants were shown films and slides taken in Mississauga and at locations in the U.S. and were taught how to recognize, define and control hazardous materials in transit, and how to plan for emergencies caused by the transport of such materials in their areas of responsibility.

The symposium will be repeated during the coming months at various key locations throughout Ontario.

When manure hits the fan, the environment suffers

An information program to advise farmers about possible environmental hazards caused by manure spills into rivers and streams in southwestern Ontario will begin in March, Doug McTavish, Environment Ontario's southwestern regional director, announced.

By John Steele

Environment Ontario and the Ministry of Agriculture and Food are developing the joint program to reach farmers in Bruce, Perth, Huron, Oxford and Middlesex counties, where the largest livestock operations are found. The program includes print advertisements, radio and television, slide shows, brochures and direct discussions with farmers.

Environment staff will advise farmers about the severe implications of manure spills to aquatic environments, and the potential health hazards to humans and animals. Agricultural officials will present information on storage procedures aimed at eliminating spills resulting from faulty storage.

The program is planned to counteract an increasing number of manure spills in the region, believed to be largely responsible for an increase in the number of reported fish killed. These incidents have doubled since 1970 to approximately 30 this year. The spills have been identified as mainly liquid manure from holding tanks.

Residents have been warned against the use of contaminated streams for drinking water, and advised to find other supplies. "We recommend that surface water be chlorinated and filtered to remove bacteria before drinking under any circumstances," said Mr. McTavish. "While the nitrate levels sampled in past incidents have not been high enough to pose specific threats to health, the potential for health problems from farm discharges is very real."

Environmental damage from manure spills can be extensive. According to Stewart Thornley, a biologist at Environment Ontario's London regional office, the main problem with manure is its high ammonia content, a substance ex-

tremely toxic to fish and the insects upon which they feed. The oxidizing of ammonia into nitrate also creates a secondary problem: so much oxygen is taken out of the water that the fish may suffocate.

The nitrate content in manure, however, makes it highly effective as a fertilizer. "Unfortunately, a watercourse rich in plant growth creates further oxygen problems as the photosynthesis and respiration process causes a huge fluctuation in the water oxygen level, which is harmful to fish. An overly abundant plant life can also smother the stream bottom, particularly when plants decay, resulting in both aesthetic problems and threats to aquatic life," said Mr. Thornley.

Even if heavy spring rains quickly flush out the agricultural spills and apparently clean up the pro-

blem, it takes at least two years before fish are replaced naturally.

Normal farming practices do not conflict with environmental regulations, although the rapid growth of farm operations in recent years has often outstripped the development of environmentally safe facilities.

The normal farm practice for manure disposal is to spread it as fertilizer in spring and fall. Liquid holding tanks or dry piles should have a storage capacity of six months, and the necessary size of the facility depends on the number of livestock in the operation. Farmers are advised to build on this basis by Environment Ontario inspectors and Ministry of Agriculture and Food engineers. Farmers without adequate storage areas may have to dispose of manure before the land is sufficiently dry.

COMING EVENTS

MARCH 5 — Joint Pollution Control Association of Ontario — Ministry of the Environment seminar on Liquid Industrial Waste Disposal — Ministry of Health Laboratories, Resources R.D., Toronto — R.V. Baker, R.V. Ander Associates, Ltd. — (416) 497-8660.

APRIL 15-16 — University of Toronto Wastewater Treatment Workshop 80, University of Toronto — Prof. J. Ganczarczyk, Department of Civil Engineering, University of Toronto, Toronto, Ont. MSS 1A4 — (416) 978-3141.

APRIL 15-16 — 3rd Ontario Conference on Waste Collection, Disposal and Resource Recovery, Harbour Castle Hilton, Toronto, Ont. NSWMA, (202) 659-4613.

APRIL 27-30 — Joint Pollution Control Association of Ontario/Air Pollution Control Association, Ontario Section, conference, Prince Hotel, Toronto — S. Davey, PCAO, Box 790, Oak Ridge, Ont. LOG 1P0 — (416) 773-4124.

MAY 19-22 — Great Lakes '80, International Association for Great Lakes Research, Queen's University, Kingston — Dr. E.D. Ongley, Queen's University, Kingston, Ont. K7L 3N6 — (613) 547-8781.

JUNE 15-18 — Ontario Industrial Waste Conference, Prince Hotel, Toronto, Ont. — Environment Ontario, Murray Cheetham, (416) 965-1658.

Sludge control

(continued from pg. 1)

— control sludge quality by establishing minimum ratios of nitrogen to 11 metals,

— control nutrient build-up in soil,

— set maximum sludge application rates depending on cropping practice,

— permit the use of stabilized sludge only,

— require waiting periods, after sludge application, prior to cropping and pasturing,

— establish minimum distances between sites of sludge application, residences and watercourses.

"Guideline implementation will be phased in over three years," Dr. Parrott said. "No changes in sludge spreading practices are required for the first year to allow municipalities to adjust their se-

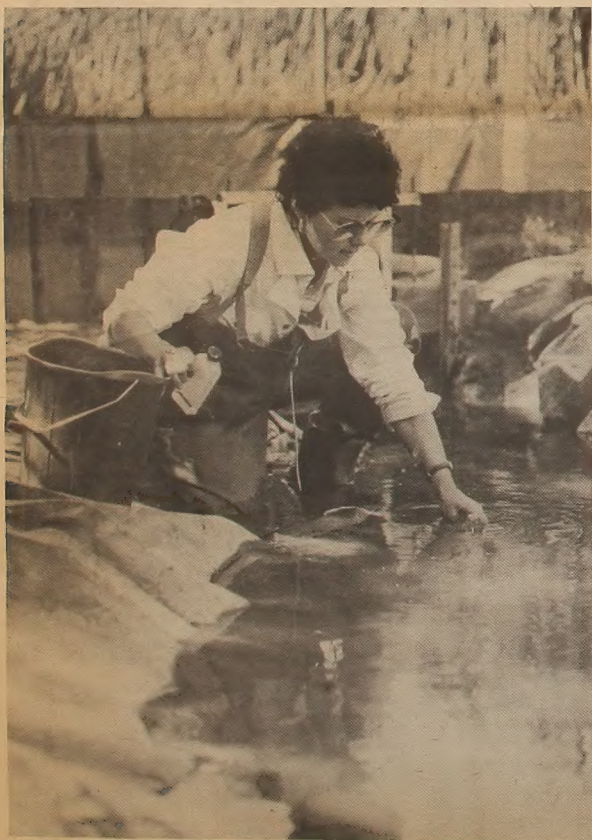
wage treatment operations and to review disposal alternatives, and to allow my Ministry to fully monitor the effects of sludge use. During the second year unacceptable sludges may be spread at reduced rates, but during the third year, only when municipalities are committed either to upgrade sludges or to secure alternative disposal facilities."

Stabilized sludge is recommended for use as a fertilizer on corn fields, on grassland used for hay and in commercial sod operations. Its use on legumes, soy beans and pasture is subject to some limitations.

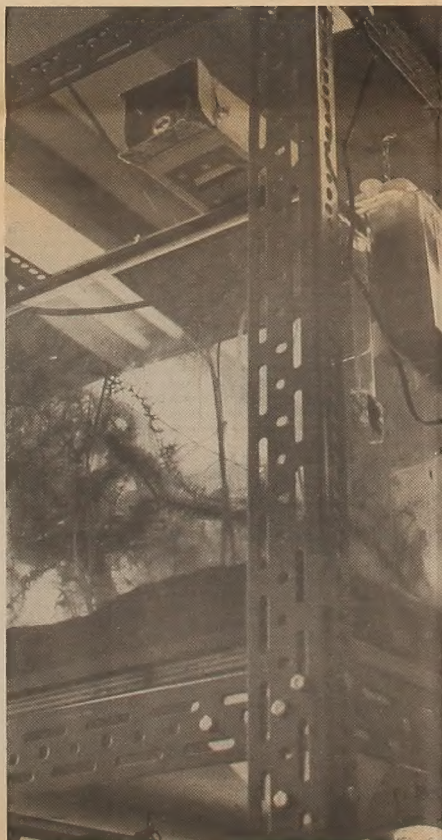
For the municipalities involved the transportation and spreading on farmland will generally cost less than other disposal methods for sludge.



Scientist Ivy Wile makes her way through a cattail swamp to reach monitoring equipment.



Nutrient fluxes in a gully are measured before the addition of partially treated sludge.



Technician Jane Smith waters cattail seeds in the laboratory to determine

The cattail — nature's way to clean water

Nature's own weapon against water pollution may be the common cattail plant. To find out how effective it is, Environment Ontario is constructing an artificial marsh composed primarily of cattail plants on 2.5 acres of land in Listowel to treat part of that community's sewage effluent.

"If the process is successful in Listowel it could be used in other parts of Ontario and save small communities the costs of building large sewage treatment plants," Doug McTavish, Environment Ontario's regional director, said. "Cattails use the nutrients found in sewage effluent in much the same way as lawns use fertilizers. When such nutrients are removed, water

courses can be kept free from a build-up of aquatic vegetation which eventually uses up dissolved oxygen. Dissolved oxygen is essential for fish and other aquatic life."

Listowel's experimental marsh will be fed sewage effluent from the community's lagoons. The cattails should remove most of the nutrients before they reach the Maitland River.

In the study, the plants will also be assessed for their ability to remove heavy metals from the effluent.

The project is funded by The Provincial Lottery Corporation and Environment Ontario.

(photos: Tessa Buchan)



line the best water depth for germination.



Technician Gord Hitchin at one of the outflow flumes



The Ministry of the Environment has decreed that more than one-half inch sludge on a field is illegal under The Environmental Protection Act. This

photo, shot at Sheldon Creek in the spring of 1979, shows sludge between six and eight inches deep. (photo: Halton Region Conservation Authority)

Sludge

— is it a blessing or is it beyond the control of the region?

By Jim Robinson

Reprinted from The Milton Canadian Champion, August 29, 1979

When the idea of using sewage treatment waste (sludge) on farmers' fields was first proposed in Halton, it sounded like the panacea everyone had been searching for.

It made it possible for waste treatment plants to get rid of solid remains from the sewage system. It

gave farmers a new source of fertilizer in unlimited quantities. And best of all, it was cheap.

But, times have changed. The idea that sludge completes the food chain cycle has fallen out of favor.

We are slowly coming to the fail-safe point when we will have more sludge than we have fields to cover it with. On top of that, it has been found that sludge isn't nature's gift fertilizer that it was once thought to be.

It can, and in some cases has been proved to, contain heavy metals such as zinc and copper which can effectively contaminate a field for upwards of 200 years.

The region is currently asking for money from the Ontario Ministry of the Environment to hire a staff person to make sure sludge management guidelines are followed.

The questions which seem to be concerning the man and woman on the street are:

— Does sludge runoff get into our streams and kill the watercourse?

— Does sludge runoff get into the water drawn from wells for human consumption?

— Do poisonous chemicals and heavy metals get into the metabolisms of farm animals and thus into our bodies?

— Can we go on forever finding fields to accept sludge or lagoons to store it in?

The current system of sludge disposal within the region hinges solely on being able to find farmers willing to accept the waste as a nutrient for crops.

That changes in September because of growing concern that sludge is being disposed in quantities too large for one plot of land, or, that it is simply being dumped anywhere when someone isn't looking.

Haulage drivers will have to indicate the exact field where each truckload of sludge is taken. A record will be kept of all water pollution control plants (WPCPs) in the region. This record cross-references with a map of all accepting farmers.

The start of sludge haulage contracts in September will include a weekly check of the records and a cataloguing of each site to ensure there is no sludge over-application.

Samples of sludge from each WPCP are sent to the Ministry of the

Environment for analysis of 11 metals and nitrogen content. The Ministry does the work as the region laboratory does not have the necessary equipment.

Analysis of crops is undertaken by the Ministry of Agriculture and is part of an intensive new campaign to study the assimilation of waste elements in foodstuff fibres.

The region is hoping it can identify all sources of heavy metal content found in Halton's sludge by the end of October. A monitoring program is currently underway to track down offenders from the region planning to institute controls.

new company

On the minus side, regional reports indicate the spectre of sludge outstripping sites and there is now obvious friction between the Ministry of the Environment, the Region of Halton, and the Halton Region Conservation Authority.

The first conflict is a restriction of ammonium nitrogen per acre guidelines set by the Ministry. This has been pegged at 200 pounds per acre under 1973 guidelines but now will be limited to 120 pounds per acre every five years.

Environment awards for Ontario weeklies

Environment Ontario participates on the annual Award Contest of the Ontario Weekly Newspaper Association by giving prizes for news, feature stories or editorials which best deal with an environmental subject having impact upon the community served by the newspaper.

From the many entries submitted for the 1980 contest, Environment Ontario selected the following winners:

Joint first prizes:

The Milton Canadian Champion for a news feature by Jim Robinson, published in the August 29, 1979 edition on the use of sludge as fertilizer. The story is a comprehensive report on an environmental practice important to agriculture and on the action being taken by responsible authorities to control abuses.

The Minden Times for a series of stories on acid rain published in August and September 1979. In this story reporters and editors have objectively dealt with the complex subject and have presented it in clear and concise terms, well understandable to a lay readership.

Honourable mention:

The Bolton Enterprise for its comprehensive spot news coverage of the disposal of contaminated soil from the Mississauga derailment.

The Kapuskasing Northern Times for a special feature reporting on environmental activities concerning the commemoration of Environment Week in the community.

Another new guideline requires sludge acreage and storage lagoons be inspected by Environment and regional staffers.

At a recent meeting of the region public works committee, Councillor Russ Miller complained that a sludge lagoon has been operating "illegally" for five years.

Mr. Miller said the facts in a ministry report were incorrect.

Ministry handling of sludge guidelines has come under heavy criticism by Murray Stephen, general manager of the Halton Region Conservation Authority.

Mr. Stephen states flatly that farmers have been conned into believing sludge is good for their crops.

One of the problems, he says, is the farmers may never get what dubious good is contained in waste.

Most of it, he claims, is deposited on fields in the winter. When spring thaw and rains come, it rolls off the frozen ground into conservation - controlled watercourses, creating a serious environmental problem.

The Ministry, in its turn, has drawn a bead on the region, blaming it for poor management.

The Ministry has gone further with a threat to withhold approval to use sludge on agricultural land unless the region redoubles its efforts to find new sites.

While taking shots at the region, the Ministry also branded Mr.

Stephen's concerns as "inflammatory" and irresponsible.

In the middle of this swirl of "it's-all-your-faults," we find Harold Middlebrook, chairman of the Halton Agricultural Advisory Committee, saying sludge dumping is beneficial if done properly and then contradicting himself, by saying sludge from Halton region sewage plants has the potential to contaminate land for "200 to 1,000 years."

The farmers, too, are beginning to wonder if sludge is a blessing or a curse.

Some have already quit accepting the waste because tomato seeds somehow manage to survive and are turning up in the middle of grain fields, sapping nutrition away from the main crop.

There has also been a reluctance on the part of farmers who feel that animal waste is okay, but, that human waste is somehow revolting to the senses.

the alternative: incineration

Halton Region Chairman Jack Raffis sees this as the last hope in stemming the growing tide of sludge (no pun intended) before it engulfs us all and gets, to use his words, "right out of control."

Mr. Raffis is convinced that if strict sludge management does not work, the only alternative will be an incineration plant somewhere in the region, built with taxpayers' money, and representing a further polluting influence to the atmosphere.

In short, we are at the cross-roads.

The decisions taken in the next few weeks are going to be critical to the whole future of waste management and its effects on residents of Halton.

bleeding or curse?

Lastly, we must inevitably come to the realization that sludge exists, will continue to be produced, and that someone is going to have to come up with a "final solution."

Acid rain

the solutions will not be simple

Reprinted from The Minden Times, September 5, 1979

The attack against acid rain and the problem it has created is moving on two main fronts. One concerns the lakes and waterways which have already been damaged by elevated levels of acidity while the second is concerned with elimination or reduction of the pollution at its source.

The principal agent for ameliorating the damage caused by acidified precipitation in lakes is the addition of a buffering or neutralizing agent such as limestone. It is the limestone content of the bedrock which protects the waterways of south western Ontario from the imbalance created by the acidic fallout.

Scientists have been carrying out various experiments in the Sudbury area in an attempt to neutralize the acidity in lakes that have "died".

...the lake won't be the same...

Dr. Harold Harvey of the University of Toronto comments on the end result of the liming procedure, "if you take an acid lake and lime it, you do not have a normal lake; you have a limed, formerly very acid lake, with a very peculiar water chemistry and a very peculiar biota as a result."

In other words, the addition of limestone to a lake may return the pH balance to near "normal" levels, but it does not mean the lake will be the same as it was before it became acidic. One Ministry of Environment scientist described the end result as a "chemical soup", a mixture in which it may be impossible to re-establish the aquatic life which existed there before.

Protection of threatened lakes or of those lakes which have experienced some increase in acidity may be possible through liming. Scientists seem to feel more optimistic about the potential of lime to protect a lake from acidified precipitation or to reverse the trend toward an increase in acidity in a lake.

liming is very expensive

Liming of affected water is certainly not a final answer but at least in some cases it could provide an extra amount of time during which a solution can be found.

However, the liming of lakes can be an expensive proposition. Dr. Harvey has estimated that it would cost \$35,000 to protect one lake in the Killarney region, using lime, for a year. Many of the lakes being affected are not accessible by road and most are distant from limestone sources.

The expense and trouble of adding the lime to area waters will have to be borne by Ontario or Canadian taxpayers. While Canadian emissions are a contributor to the overall problem,

studies have demonstrated that a large majority of the acid rain falling in Ontario originates in the U.S. That means the polluters are not being held responsible for the damage they are causing — a situation that is both unfair and unlikely to lead to corrective action on the part of the polluters.

In addition to the "chemical soup" results mentioned earlier, adding lime does not reduce the loading of heavy metals. The increased acid levels in precipitation have been blamed for freeing the movement of such heavy metals as mercury and lead. These metals in turn are more readily available to fish and other aquatic life, in some cases making them unsuitable for human consumption.

While scientists are not yet sure of the impact acid rain is having on soil and terrestrial plants there seems to be a general agreement that some harm, perhaps similar to that being done to aquatic life, will eventually result. Obviously the liming of the lakes and rivers is not going to change the acidity of the rain falling on the soil.

Finally, liming may prove to be of some remedial value to area lakes, but there is also a concern that people may view the neutralizing agent as a final solution. Dr. Harvey recently expressed concern that those causing the pollution may point to liming as the answer, saying in effect that the problem has been solved and there is no need for them to take any remedial abatement action.

fundamental change in attitude

According to almost everyone involved in the investigation of the acidic precipitation problem the only lasting solution is to be found in reducing the amount of sulphur and nitrogen being added to the atmosphere. As simple as the statement may sound, it is not an easy remedy. It is one that will require in the words of the Minister of Environment, Harry Parrott, "a fundamental change in the attitude of consumption which exists in North America."

Since such a large portion of the pollution originates in another country, any long-lasting abatement plan will require international cooperation and initiative.

The basis for such an undertaking already exists as Canada and the United States have attempted to eliminate trans-border water pollution and other problems through the International Joint Commission. While some observers have been less than enthused with the success of the IJC in certain areas, there is a general consensus that through the efforts of the commission, water pollution in adjoining waterways has been identified and in numerous cases remedial action has begun or a course of corrective action plotted.

With this sort of experience it is hoped a similar agreement can be reached with the U.S. to limit the amount of transborder, airborne pollutants.

The Ontario Ministry of the Environment has already indicated to the federal environment minister that it is eager to have negotiation for such an accord started as soon as possible. Other provinces as well have indicated their concern to the federal government, although the extent of their problem and identification of sources is not as well documented as is the case in Ontario.

technology exists

However, a number of problems may block an easy resolution of the problem.

While the negotiation that will take place will be between Canada and the United States, on both sides of the border there are secondary levels of government to deal with. Obviously state and provincial authorities must agree with any final treaty if enforcement is to be uniform. Forcing industries in some states, particularly those not as seriously affected as Ontario or northern New York by the pollution, could be difficult.

Abatement technology exists already which can remove up to 93 per cent of sulphur dioxide from smoke-stack emissions. However, in all cases, the installation of the necessary machinery is expensive and time consuming. In some instances older plants might have to be replaced to accommodate the updated equipment. It is unlikely the operators of the electrical generating stations or the polluting plants will voluntarily spend vast sums of money for environmental protection so far from the point of operation.

Harry Parrott, the Ontario Minister of the Environment, stated any effort to reduce acid precipitation will require a change in our lifestyle. More accurately his comment should have indicated that the residents of the areas affected by acid rain must now attempt to convince others, those in source areas, that they must reduce their consumption to save our lakes. Perhaps our greatest ally in such efforts will be the State of New York and several other northern states where acid rain has done as much harm as it has here.

A further complication to the abatement efforts is the statement of President Carter earlier this summer on energy. The President indicated there would be a shift in U.S. energy priorities to the consumption of more coal to replace imported oil. While he also indicated that protection of the environment was important, Carter made it clear that environmental considerations would not stand in the way of reducing the United States' dependence on foreign oil. This may well mean that strict

(continued on pg. 11)



(photo: R. Koci)



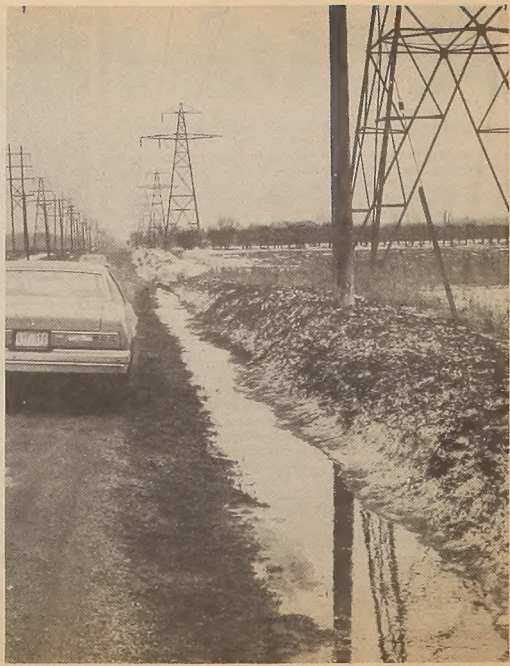
(photo: R. Koci)

Monitoring and sampling of lake waters within the acid rain research programs of Environment Ontario is much more difficult in winter. During the rest of the year it takes only a few minutes to record instrument readings, measure water flow and take samples. In winter, often thick accumulations of ice must be removed at the monitoring station by axe (photo on top) before flow can be measured and filtered samples can be taken (photo below).



(photos: Halton Region Conservation Authority)

This photograph shows sludge in Sheldon Creek. Conservation authority general manager Murray Stephen took this picture and says it refutes the Ministry of the Environment statement that there was no pollution in the creek.



A Halton Region Conservation Authority car is shown parked on a road one-quarter mile from Sheldon Creek. Here, dried sludge can be seen on the roadside and on the embankment. The sludge was wind-blown to the site. Passing cars also raised a cloud of sludge dust.

Sludge

(continued from pg. 8)

But who is going to draw the short straw?

Halton Public Works Committee Chairman Ron Planche feels the short straw will have to be drawn by the region because "under the act, we have the responsibility for handling sludge."

Mr. Planche said short-term and long-term solutions are necessary.

"In the short term, we are going to have to hire a person to specifically monitor sludge haulage despite our staff hiring freeze," he said.

But he goes on to admit that monitoring is all well and good as long as there is a place to dump it and that means farmers' fields.

"We recently had a meeting on sludge and I had to walk out because it was going nowhere."

"But, what I said as I walked out is that we are just not packaging this thing right."

"My kids just came back from the zoo (Metro Toronto Zoo) and they had a bag of 'Zoo Poo' with them."

Now it doesn't matter that it is elephant waste or tiger waste, it still is a great gimmick, and what's more important, the Metro Zoo has found a way to dispose of their waste problem.

"I guess I would like to see an upgraded program to communicate the benefits that sludge holds for the farmer."

"You know, it's like taking aspirins for a headache."

"If you take 20 aspirins you are going to die, but if you take just two, your headache goes away."

"So, what we have to lay out, is the benefit involved by employing sludge to its most beneficial aspects,

"It also is a benefit in terms of taxes."

"If we have to build a big incineration plant, it's going to mean increased assessment and the farmers are going to have to pay too."

**the answer:
burn it!**

Mr. Planche is more cautious when he talks about the long-term solution for sludge, but he agrees that the region faces a problem it cannot afford to ignore.

"I have to be a realist," he said. "We are going to produce more and more sludge as our population grows and this is the reason we have hired a consultant to help us out," he said.

That long-term answer is summed up by Mr. Planche with two words — "Burn it!"

Currently, there are three ways of handling sludge: spread it, bury it, and incinerate it.

Spreading is decidedly short term. Burying sludge could lead to leachate.

Burning sludge is a new technology, but Mr. Planche feels it may have a solution, albeit one that has been suggested many times before.

Because of the Supreme Court decision in regard to the handling of sludge in Sault Ste. Marie, it leads to the conclusion that we have the complete control of sludge.

"I would like this control to run from production in the sewage treatment plant through to incineration."

"Now if I can just expand this to cover all garbage, including sludge, there is what I would like to see done."

"Because a great proportion of garbage is paper we could use this to augment the fuel used in the incineration plant."

"The remainder, the fly ash, could be used for the base of parking lots and road beds."

"I think it is possible to take the sludge and put it through a centrifugal process that dehydrates all the water out."

"The water would go for treatment and what would remain is a dry solid which we could incinerate; or if it burns, use it as fuel too," he said.

Dehydrating is done in the United States. The remaining solid is marketed under the name "Milogamite" and sold in small bags as household plant fertilizer.

Mr. Stephen said the region's move towards monitoring is encouraging, but, "I want it handled properly."

Mr. Stephen said he firmly believes the problem could be solved to a great degree if the region follows and the Ministry of Environment enforces its guidelines for sludge dispersal issued in 1973 and 1978.

But, he is distressed that "every time we have called them, they have said everything is okay and there's nothing to worry about."

He said this attitude continued until spring when a case of blatant disregard for MOE guidelines was virtually dismissed.

It was the straw which broke into a verbal war between the Ministry and the Authority.

The case involved Sheldon Creek.

Mr. Stephen found sludge six to eight inches deep although the MOE guideline states no more than one-half inch is acceptable.

He found sludge flowing into the creek in great quantities and even found it on a roadside where it was being blown into the air by passing cars.

What's more, he photographed everything so there could be no question from the MOE, which Mr. Stephen says, "likes to give the stall in the hope the problem will go away."

He lays the blame at the feet of the MOE and the sludge haulers.

**the last straw:
Sheldon Creek**

Admitting "the ability to enforce the guidelines is a weakness," Mr. Stephen, nevertheless, feels a major turnaround in MOE philosophy is needed before positive enforcement goals can be obtained.

"The Ministry of the Environment is there to protect and they see this in such a way that they cannot bring themselves to admit there is a problem when one exists."

"They seem to feel that they just can't admit they are lax and cannot admit the failure in sludge enforcement," he said.

Mr. Stephen said "75 per cent of our problem" could be effectively solved if the MOE insisted on winter storage of sludge in man-made facilities.

Currently, sludge is spread in the winter months and sits on the ground until spring. As evidenced by Sheldon Creek, the spring break-up means a large portion of

that waste gets into the water.

A man-made facility would have to be licensed by the MOE, Mr. Stephen contends, and there could be no additional storage of sludge in part of Halton without prior site inspection by the MOE.

"I will say I am encouraged that the region has decided to bring in a person specifically for monitoring."

"But I want guarantees, not empty verbal promises, that the MOE is going to police not just Halton's sludge, but the sludge which is being brought in from other MOE plants in areas like Peel Region."

"In short, I want to know that they are going to govern themselves as well as they govern others in the Region of Halton," he said.

Mr. Stephen said he does not know how much sludge comes from outside Halton but gave a ball-park estimate of 50 per cent.

Lastly, Mr. Stephen, when asked the question about policing illegal haulers of sludge, said, "I think the Ministry should start with the ones they licence first."

The Ontario Ministry of the Environment categorically denies Mr. Stephen's suggestions.

The Ministry's district officer, Alex Giffen, in a 10-page brief to Halton, noted the MOE was "very disturbed by the central theme of the Stephen submission."

Placing the responsibility of sludge haulage and administration of the resultant contracts squarely with the region, he said "the Ministry role is regulatory and, as the generator, the Regional Municipality of Halton is ultimately responsible for the safe handling and disposal of its sludge without environmental damage."

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Acid Rain

(continued from pg. 9)

(U.S.) Environmental Protection Agency guidelines for pollution abatement and control might be loosened to help achieve this goal.

With these options in mind the next move is now up to the various levels of government. How quickly and seriously they act is dependent on the pressure brought to bear by the citizens of both countries.

A number of Haliburton cottage associations have already passed resolutions calling for measures to protect area lakes. The Mountain Lake Property Owners' Association, as a case in point, has written to Prime Minister Clark, President Carter, Ontario Premier William Davis, state governors and others expressing their concern.

The Federation of Ontario Cottagers' Associations are actively considering the matter and letting member groups know how serious the problem is.

Environmental groups like the Federation of Ontario Naturalists and Pollution Probe are bringing

pressure to bear on governments. The Federation is also exploring the possibility of an alliance with U.S. environmental groups so a concerted campaign can be launched on both sides of the border.

The interim report of the Ontario Legislature's Standing Resources Development Committee stated in June of this year: "The committee recognizes the role of the public is crucial in any demonstration of political will. Although the seriousness of the acidic precipitation problem is well recognized by the Ministry of the Environment, by the federal department and by the scientific community, general public awareness is not evident... When there is public awareness, particularly among those who currently enjoy the use of susceptible areas, there are indications of strong support for tough environmental protection measures even if the measures should entail public costs that they will have to share..."



To allow the exact measurement of important data Environment Ontario has built permanent concrete flues on the inflows and outflows of the Dorset area lakes under study for acidic precipitation ef-

fect. At the same sites solidly built heated shelters house sensitive monitoring instruments registering continuously changes in water flow.

(photo: R. Koci)

Lottery funds for acid rain research

A \$197,000 provincial lottery grant will be used this summer by the Ministry of Natural Resources to control contaminants entering lakes and rivers and to help finance a study of the effects of acid rain on fish populations.

Natural Resources Minister James Auld said erosion control measures will be undertaken along certain southern Ontario trout

streams to prevent silt from being washed into the water.

Besides destroying fish habitat, the silt contains contaminants that can be absorbed by the fish. If accumulated, the fish are unsuitable for human consumption.

Assisting the ministry will be various conservation authorities,

the Ministries of the Environment and Agriculture and Food and several federal government agencies.

Mr. Auld said the erosion control work — shrub and tree planting, livestock fencing to prevent streambank destruction and construction of streambank retaining walls — will be completed this summer along sections of Bothwells Creek, Reynolds Creek, Nine Mile River, Komoka Creek, Duffin Creek and several other waterways.

His ministry will also cooperate with the Ministry of the

Environment on studies on the effects of so-called acid rain. Sulphur and nitrogen oxides entering the atmosphere from industry and other sources can combine with moisture to form mild acids that fall as rain.

A build-up of acid in a lake where there is no natural occurrence of limestone to buffer the acidity can destroy habitat for fish and other aquatic life.

Mr. Auld said the ministry will increase its collections of water samples in the Lake Superior and Lake Huron areas for testing by the

Ministry of the Environment this summer.

In addition, the ministry will also help finance one of several studies by Dr. Harold Harvey, a leading acid rain researcher at the University of Toronto. Dr. Harvey will determine the effects of acid rain in the lakes south-west of Sudbury, around Killarney Provincial Park.

Among other things, Dr. Harvey will study how acidic waters affect fish in their various stages of development and how patterns of change occur in lakes that become acidic.

New manual deals with cottage problems

During the past years Ontario's growing cottage population has become increasingly aware of its responsibility for the preservation of the environment. To help to carry out this responsibility, Environment Ontario has published, in co-operation with the Federation of Ontario Cottagers Associations, "Cottage Country" — an environmental manual for the cottager.

The book contains in its 50 illustrated pages answers to a host of questions encountered in cottage and outdoor life and solutions to problems that have an impact on the cottager's environment.

The chapter on water quality, for example, explains the effects of bacteria and eutrophication and how to measure the condition of waterbodies and their changes.

Special chapters are devoted to the control of aquatic plants, and to the purification of water for drinking.

Toilet systems — from the humble but antiquated outhouse to the modern septic systems — and their advantages, disadvantages and the laws governing their installation are governed in detail, as is the control of insects and the use of pesticides.

For the disposal of solid waste, composting is recommended and alternatives to open burning are suggested.

A further section of the book describes the Ontario regulations concerning the disposal of waste from boats and marina operations.

The chapter on cottage development describes measures that can be taken to control the impact of cottaging on the environment, on water and on wildlife, and suggests action plans for local governments.

In conclusion, the book lists the regional and district offices of the Ontario ministries of the Environment, Natural Resources, Northern Affairs and Health.

A bibliography lists publications developed by government and private organizations concerned with the protection of the environment and of wildlife.

"Cottage Country" is available free of charge from:

Publications Centre,
Ministry of Government
Services,
5th Floor,
880 Bay Street,
Toronto, M7A 1N8



(photo: Ron Johnson)

Clean water may not be healthy. "Cottage Country" explains how to find out whether it is.

canadian waste materials exchange



One man's waste is another's delight

By Roger Davies

What do a downtown Toronto popcorn manufacturer and an Ontario pig farmer have in common?

On the surface, not much.

The connection, however, is straightforward: the farmer's pigs eat the manufacturer's waste popcorn. And both participate in a unique waste exchange program that contributes to keeping Ontario's environment clean.

The philosophy of the program, developed by the Ontario Research Foundation, is simple: One man's waste may be another man's delight, i.e., companies and municipalities across Canada may have a waste product that could be used by someone else.

Ontario Research, with sponsorship from Environment Canada, therefore developed and since January 1978 has published six times a year a kind of "industrial waste bargain hunters' press." Officially called The Canadian Waste Materials Exchange Bulletin, it contains detailed listings of wastes that are available across Canada. The names of waste producers and users are kept confidential, so that a company wanting to use someone else's waste must first contact Ontario Research, which will put both parties in touch. "But we don't get involved at all in any of the negotiations," stresses the program's manager, Dr. Bob Laughlin.

He points out that the basic philosophy behind the waste material exchange is "to help return much of what is now regarded as waste to an alternative industrial use."

This may be achieved directly by one industry buying waste as a substitute raw material. Or it may occur via an intermediary such as a

reprocessor or scrap dealer. This way, valuable raw materials are saved. Energy is also saved by not having to process raw materials.

And environmental damage is avoided.

After nearly two years, the program is judged a success. Some 6,000 companies participate and receive bulletins regularly. Of the 1,100 odd wastes listed so far, over 80% have attracted inquiries. In fact, there has been an average of 4.1 inquiries per listing; i.e., a total of nearly 4,500 inquiries.

from as far as Tokyo

The true success can be judged by the number of wastes actually transferred. Dr. Laughlin estimates that to date the annual tonnage exchanged has been around the 80,000 mark, whose value as substitute raw material is about \$3.5 million.

"We actually feel that this is a conservative figure. However, aside from the financial aspect and the tonnage of wastes not disposed of by conventional methods, there are additional benefits. The program has got people thinking more about recycling."

"Also, although shifting wastes among members of a particular industry (such as the petroleum industry) has taken place before, now we're stimulating exchanges among different industries."

One of the biggest difficulties is that people seem to pre-judge their wastes. "Some people have just assumed that no one would be inter-

ested in their waste. In fact, we found in many instances that some items, which seemed on the surface absurd to consider, have in fact been exactly what someone else wanted. As an example, wooden pallets that most industries use for carrying and storing purposes are often thrown out in bulk. We found there was quite a demand for this material."

Although some 50% of the exchanges have taken place within Ontario, the program is a national one. Exchanges, however, tend to take place within a local area because of the costs of transportation. But in 12 instances there have been exchanges involving distances of over 1,000 miles (between Alberta and Ontario).

Typical exchanges have involved recycling waste plastic, which is snapped up for manufacturing the familiar red cones on highways, as well as butts for hockey sticks and floor tiles.

The list of subscribers to the bulletins is increasingly daily. Industrialists, municipalities, farmers... from as far afield as Alabama, Los Angeles and Tokyo. Somehow they all have found out about the exchange program.

As the program moves into its third year, efforts are being made to make it self-sufficient. Subscribers are being charged \$20 per year for the bulletin and some service companies pay for professional card listings. And all looks good for the future of this information exchange program that is helping protect Ontario's environment — and feed its pigs.

People interested in participating in the program can find out more about it by calling Bob Laughlin or Isobel Duncan at (416) 822-4111 Ext. 210.

WASTES AVAILABLE / DÉCHETS DISPONIBLES

Region/Region	Quantity/Quantité	
AA 411 S	500 6/90 bushels	Acetate film (IS, Jari)
AA 412 S	600 10/100 bushels	Rubber coated polyester fabric
AA 413 G	1 000 10/100 bushels	Rubber coated nylon fabric
AA 414 P	5 tons/day	Automotive carpet cutting nylon, PE backing (Larofa)
AA 415 S	35 tons/month	Wool rubber slitting (Dorbrook)
AA 416 K	3000 10/100 bushels	Textile slitting wool, cotton, nylon (Winipeg)
AA 417 S	1000 6/100 bushels	Polyester felt slitting
AA 418 S	1000 10/100 bushels	Mixed woven felt slitting
AA 419 S	1000 10/100 bushels	Nonwoven wool felt slitting (Spartan)
AA 420 S	1500 10/100 bushels	Slapping waste wool
AA 421 S	1000 10/100 bushels	Shoring waste wool
AA 422 S	1000 10/100 bushels	Chrome plated fabric slitting (Gargano)
AA 423 S	200 10/100 bushels	Vinyl coated fabric slitting (Cathedral)
AA 424 S	300 10/100 bushels	Small fabric scraps (S&S)
AA 425 S	3000 10/100 bushels	Off grade vinyl coated fabric
AA 426 S	1000 10/100 bushels	Fabric waste (Montreal)
AA 427 S	1000 10/100 bushels	Flange yarn waste
AA 428 S	1000 10/100 bushels	Fabric cutting waste (Pembroke)
AA 429 S	1000 10/100 bushels	Fabric cutting waste (Pembroke)
AA 430 S	1000 10/100 bushels	Fabric cutting waste (Pembroke)
AA 431 S	1000 10/100 bushels	Fabric cutting waste (Pembroke)
AA 432 S	1000 10/100 bushels	Fabric cutting waste (Pembroke)
AA 433 S	1000 10/100 bushels	Fabric cutting waste (Pembroke)
AA 434 S	1000 10/100 bushels	Fabric cutting waste (Pembroke)
AA 435 S	1000 10/100 bushels	Fabric cutting waste (Pembroke)
AA 436 S	1000 10/100 bushels	Fabric cutting waste (Pembroke)
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AA 447 S	1000 10/100 bushels	Fabric cutting waste (Pembroke)
AA 448 S	1000 10/100 bushels	Fabric cutting waste (Pembroke)
AA 449 S	1000 10/100 bushels	Fabric cutting waste (Pembroke)
AA 450 S	1000 10/100 bushels	Fabric cutting waste (Pembroke)

WASTES WANTED / DÉCHETS DEMANDÉS

Region/Region	Quantity/Quantité	
7 PLASTICS PLASTIQUES		
AW 015 K	Unlimited	Photocopying
AW 016 L	35 000 lbs/month	Low density packaging grade scrap
AW 017 R	Unlimited	Low density packaging grade scrap
AW 018 S	Unlimited	High density PVC scrap
AW 019 S	20 000 10/100 bushels	High density PVC scrap
AW 020 S	10 000 10/100 bushels	High density PVC scrap
AW 021 S	10 000 10/100 bushels	High density PVC scrap
AW 022 S	10 000 10/100 bushels	High density PVC scrap
AW 023 S	10 000 10/100 bushels	High density PVC scrap
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AW 099 S	10 000 10/100 bushels	High density PVC scrap
AW 100 S	10 000 10/100 bushels	High density PVC scrap

The facsimile of two of 26 pages of a recent exchange bulletin show the wide range of materials available and sought on the "waste market".

Sludge

(continued from pg. 10)

Mr. Giffen said to ask that every sludge operation be assessed for environmental damage as Mr. Stephen suggests, is just too much to ask.

"It should be understood that the Ministry can make observations of the occasional spreading operation, but it is another matter for the Ministry to observe every disposal operation in the Province."

However, Mr. Giffen was clearly unhappy with the heat being generated towards the MOE with criticism about slow response times to spills and spotty testing methods.

"The Ministry has tried to encourage the utilization of sewage sludge on agricultural lands and the staff has played a significant role in assisting the haulers and farmers in establishing suitable sludge storage and disposal sites."

"However, it is abundantly clear that there is not general satisfaction with the sludge utilization program, as evidenced

by the continued criticisms by the region's publicly elected representatives and the nature of the complaints made including those of the conservation authority.

"There appears to be every effort to discredit the sludge utilization program and eliminate the practice in Halton Region as much as possible."

there is a gremlin

There is a gremlin in sludge — the tomato seed.

They are so small that it is hard to screen them out of sludge. They do not seem to freeze during winter storage. They are a succulent, and as such, they are rooting and deriving nutrient long before the principal crop has germinated.

According to the MOE's own

survey of farmers, it has been found that they either accept sludge or they don't. There is no grey area in between.

For the most part, the Ministry has found that farmers dropping out of the program have had "unsatisfactory experiences with tomato seeds in grain crops."

The Ministry has found "another attitude difficult to change" is an unwillingness on the part of farmers to accept waste of human origin while they have no qualms about animal manure.

Because sludge is only permissible on grain crops, it means that the use of sludge for vegetables or in cattle grazing areas is prohibited, thus further limiting the available acreage in Halton suitable for disposal.

As the amount of sludge being produced is an arithmetic progression of the increase in population, the problem comes back to Mr. Planche and is leaning towards incineration.

Part of Mr. Planche's idea of using sludge as a fuel, plus the 59th annual conference of the Agricultural Institute of Canada, may hold a signpost to the future.

The annual conference, held in New Brunswick one week ago, had

more than 900 delegates from across the country. Its prime topic was turning farm wastes into energy sources.

acreage for fuel crops

There is already experimentation in the United States where moonshine stills are being used to create a gasoline substitute.

South Africa is experimenting with sugar beets as an automotive fuel source.

The delegates at the Fredericton convention agreed crops could be grown for fuel purposes but wanted a clear understanding that setting aside acreage for fuel crops would not affect food production.

Could sludge be substituted for crop fuels thus leaving agricultural land free for food production?

During World War Two German scientists constructed "ersatz" oil refineries when the Allies cut off the country's source of oil. Basically, they found anything that

has a carbon content (wood, shale, waste) had the potential of producing oil and crude gasoline.

More importantly, these synthetic fuel plants worked with relatively good results.

With the massive Ontario Research Foundation located on Halton's border in the Sheridan Research Park, it may be time for someone or some official body to initiate a program of producing our own sludge-based ersatz oil factories. It should be noted that Gulf Oil Canada maintains a special research facility in Sheridan Park.

If such a production system is workable, it just may be possible to obtain world-wide patents.

Imagine the results if Halton Region was part holder of that patent!

But for now, sludge and its disposal remains a region problem, and one which is going to cure itself.

Tough new decisions will have to be taken.

And while it may not seem possible at this time, the crucial juncture has been reached. Whichever road we follow, it will be a path of dispute, disruption and despair.